

Well maintenance cleans up problem for Miltonvale

Late in July 2009, William Jackson, the new operator for the city of Miltonvale, contacted me about chlorine residuals dropping dramatically in water produced by the city's Well No. 8. Miltonvale is a town of about 500 people and is located in southeastern Cloud County.

William and I discussed the possible causes for the reduced water production. I had previously instructed operators at Miltonvale on well treatment and cleaning procedures that also corrected common bacteriological problems: slime producing, sulfide and iron bacteria. William asked for help to treat the well; his co-worker, Curtis Swenson, had participated in prior treatment projects but they would appreciate KRWA's assistance. The last treatment by Curtis allowed a high dosage of chlorine to remain in the well for

While the quality of the water improved, the benefit was short-lived for only a few months. The city wanted this treatment to be conducted as soon as possible.

only an hour. While the quality of the water improved, the benefit was short-lived, lasting only a few months. The city wanted this treatment to be conducted as soon as possible.

I contacted KRWA Tech Greg Metz to ask if he'd like to be involved – and of course he did. We coordinated with the city to conduct the well cleaning beginning on Tuesday, August 4. The city had a 1,000-gallon water tank on a trailer available; it was complete with pump and banjo fittings to pump to and from the well.

Preventive maintenance pays

The goal was to treat the well with a 500- to 1000-mg/l chlorine dosage. We mixed ten gallons of 12.5 percent sodium hypochlorite with 500 gallons of water and drained the mix into the well. We then pumped 1,000 gallons of water from the well back into the tank. We added one quart of Ivory dish soap to this mix. The mix was drained back into the well. The tank was filled and drained back into the well three times. Our hope was to force the chlorine mix further back into the aquifer. After this surging, we allowed the well to rest for 24 hours.

The next day, we pumped 1,000 gallons from the well into the tank. There was a lot of discolored water and suds. We continued pumping the well, flushing the remainder of the chemical to waste in a drainage ditch. The water in the tank and at the flush point contained a lot of brown, soft material with the consistency of algae slime and small chunks of rust and very brown water. After three hours of flushing, the chlorine residual was back to zero. The



William Jackson, Operator at Miltonvale, and KRWA Tech Doug Guenther discuss the chlorination treatment. The goal was to treat the city Well No. 8 with a 500- to 1000-mg/l chlorine dosage to remove iron and other bacteria.

well was then put back into service.

As the well was being put back into service, we noticed that the chlorinator was not working properly. The city uses liquid chlorine (sodium hypochlorite) and a peristaltic pump. The metering tube in the pump needed to be replaced, and the injection point was plugged with minerals and rust. We repaired and cleaned the pump and it was back in service and operating satisfactorily.

Not having any lab testing done we took raw water samples before chlorination from Well No. 8 and Well No. 4 which is located a block away; Well No. 4 pumps from the same aquifer. We then filled clean glass jars with the same amount of raw water from both wells and added .20 of a milliliter of 12 percent sodium hypochlorite with a syringe. The residual of Well No. 8 tested 8.2 mg/l free and Well No. 4 tested 4.4 mg/l. We sealed the jars and allowed them to stand 20 hours sealed. We then tested the water again. Well No. 8 tested 8.0 mg/l free; water from Well No. 4 was consistent with the earlier reading. The test proved there was no loss of chlorine residual in the water from Well No. 8.

As of August 10, 2009 the water at the point of entry of Well No. 8 had been maintaining 2.2 mg/l free residual. There have been consistent and adequate chlorine residuals

As of August 10, 2009 the water at the point of entry of Well No. 8 had been maintaining 2.2 mg/l free residual. There have been consistent and adequate chlorine residuals throughout the distribution system.

throughout the distribution system.

Generally, the wells that I and other KRWA staff have treated in this manner have had excessive problems of drawdown. Obviously, the bacterial growths plug the well screens. An expert in water well design, construction and operation has stated if production is allowed to drop to 60 percent of well capacity, total capacity cannot ever be regained without more expensive methods of treatment needed. And those treatments often only stay ahead of the problems. In the case of the well treatment at

Miltonvale, the chlorine cost was \$2.72 per gallon; we used Ivory that cost \$1.50. The total chemical cost was \$28.70. The project involved five hours of pumping. I think that's pretty inexpensive well maintenance.

This maintenance cleaning is no guarantee that the infection will not return. For example, a well at the city of Chapman is such a case. The well tested positive as having all three forms of the bacterial infestations. I helped perform the same procedure on that well as has been conducted on scores of other wells. But in the case of the Chapman well, the infestation returned in a few months – along with very high chlorine demand. The city discontinued using the well. After a year passed, the bacteria cleared up. That seems impossible to explain.



Haynes Equipment Co., Inc.
15725 Pflumm Rd.
Olathe, KS 66062
www.haynesequip.com
Ph: 913-782-4962
Fx: 913-782-5894



Contact Haynes Equipment Co., Inc.!

- 24/7 Hour Emergency Service
- Authorized Warranty Service Center
- Free Design Review
- Servicing **Kansas and Western Missouri**

Supplying Environment-One Low Pressure Sewer Systems for the needs of:

- Septic System Replacement
- New Development
- Municipal Rehab Projects



Got LayneOx™?



**Exceptional
Hi-Rate Catalytic
Filter Media
for treatment of**

- Arsenic
- Manganese
- Iron
- Hydrogen Sulfide
- Radium/Uranium

For LayneOx™ and Other
Water Treatment Technologies
Contact Layne Christensen Company
913-321-5000
treatment@laynechristensen.com



Layne Christensen Company
Water Resource Division



Water pumped from the well after surging the 1,000 gallons of highly chlorinated water in the well contained a lot of brown, soft material with the consistency of algae slime and small chunks of rust and very brown water.

The well is close to the Smoky River so did the bacteria travel downstream? The irony is that the well was very useful after the tornado in 2008 as it was spared of destruction; it was used to maintain a water supply for the town. The moral of that story is that it pays to perform preventive maintenance – and certainly on water wells.

Doug Guenther has worked as Technical Assistant for KRWA for 11 years. Doug worked for the City of Oakley in the Water and Electric Department for 8 years. He has also worked several years for an industry supplier. He is a Class II Certified Water Operator.



He is a Class II Certified Water Operator.



Utility Service Co.
INCORPORATED

America's Tank Maintenance Company!

Utility Service Co., Inc.
(USCI), whose origins date back to 1963, is the premier provider of professional water tank services. USCI maintains thousands of potable water tanks under full service asset management programs coast to coast.

USCI provides tank funding and procurement services for new tanks and site management services for antennas on both existing and new tanks.

Now Utility Service Co., Inc. introduces...



WaterMix
The Right Mix for Cleaner Water

Improve your water quality by minimizing organics, stabilizing disinfectant residuals, eliminating thermal water stratification and maximizing filter media efficiency.

Call your local USCI Representative today...

Tom Stechmann • Phone: 314 420.4912
tstechmann@utilityservice.com • Liberty, MO